OLYMPIC COAST
NATIONAL MARINE SANCTUARY
Meeting Minutes

OCNMS Advisory Council Meeting
September 23, 2016

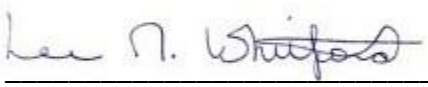
University of Washington's Applied Physics Laboratory- Henderson Hall
Seattle, WA

Olympic Coast National Marine Sanctuary
NOAA, Office of National Marine Sanctuaries
115 E. Railroad Avenue, Suite 301
Port Angeles, WA 98362-2925

Reviewed by OCNMS Superintendent:

Carol Bernthal, Superintendent

Approved by AC Chair:



Lee Whitford, Chair

Advisory Council (AC) Members/Alternates in Attendance: Lee Whitford (Education, Chair), John Veentjer (Marine Industry, Secretary), Roy Morris (Citizen at Large), Jan Newton (Research), Jodie Toft (Conservation), Steve Shively (Tourism/Economic Development), Casey Dennehy (Marine Resources Committee), Mark Ozias (Clallam County), Dan Ayres (WDFW), Jennifer Hennessey (WDOE), Katrina Lassiter (WDNR), David Hudson (Hoh Tribe), Jennifer Hagen (Quileute Tribe), Commander Aaron Meadows-Hills (USCG), Stephanie Sleeman (US Navy), Mike Barton (Education alternate), Tom Mumford (Research alternate), Lora Leschner (Conservation alternate), Josh Peters (WDNR alternate)

Presenters and Others in Attendance: Dr. Parker MacCready (UW School of Oceanography), Dr. Robert Embley (NOAA-PMEL), Dr. Simone Alin (NOAA-PMEL), Meg Chadsey (WA SeaGrant), Dr. Nancy Messmer (COASST, WA Clean Coast Alliance, Lions Club), Dr. Richard Feely (NOAA-PMEL), Adam Dilts (NOAA-OGC), Catherine Gockel (US EPA Region 10), Dawn Grebner (US Navy Keyport), Jeff Hummel (Hummel & Associates), Nives Dolsak (UW School of Marine and Environmental Affairs Professor) and nine SMEA graduate students: Mackenzie Nelson, Henry Peterson, Danielle Edelman, Brittany Flittner, Emily Rhoades, Kanae Komaki, James Roubal, Alex Gustafson, Katie Keil

NOAA/OCNMS Staff in Attendance: Carol Bernthal, George Galasso, Liam Antrim, Kevin Grant, Jenny Waddell, Kathy Hough, Karlyn Langjahr (OCNMS), Dayna Matthews (NOAA-OLE)

Jan Newton, Co-Director of Washington Ocean Acidification Center (WOAC) and Professor of Oceanography at University of Washington (UW), welcomed council members to the UW's Applied Physics Laboratory in Seattle.

Adopt Agenda – The draft agenda was adopted with an addition to Internal Affairs on "ONMS Advisory Council Chairs webinar," proposed by Chair Lee Whitford. ***It was passed by full AC member consensus.***

Internal Affairs:

Approval of July 2016 SAC Meeting Minutes – There were no proposed edits or changes to the Sanctuary Advisory Council meeting minutes. ***Tom Mumford motioned to approve the meeting minutes without changes and Lora Leschner seconded. There was no further discussion and motion passed by full AC member consensus.***

Report on Ocean Acidification Sentinel Site Workshop– Lee Whitford, Chair of the Ocean Acidification Sentinel Site (OASeS) Working Group, reported that 38 researchers, resource managers and educators participated in the Olympic Coast OA Sentinel Site workshop at ONRC in Forks on September 12-13. The overall goal of the OASeS workshop is to explore the scope and potential functions of an Olympic Coast ocean acidification (OA) sentinel site, identify relevant partnerships and collaborations to support it, determine priority information and products to meet science, communication and education needs regarding OA, and explore how an Olympic Coast OA Sentinel Site could leverage larger OA efforts within NOAA and other

organizations. The workshop started off with four panels, including science in national marine sanctuaries and OCNMS, partners and activities, education and communication, and our vision of an Olympic Coast OA sentinel site. This was followed by four break-out groups on vulnerability and indicators, exploring priority questions application of information for, and an awareness campaign of an Olympic Coast OA sentinel site. Representatives of each of the major constituent groups delivered their final perspectives, participants ultimately self-declared an Olympic Coast Sentinel Site for Ocean Acidification.

OCNMS staff members and partners are now working to continue the momentum. The advisory council's OASeS Working Group will reconvene to refine the purpose and tasks based upon results of the workshop and identify short- and long-term actions for implementation. Their first task will be identifying the framework for the final workshop report before its public distribution. Kevin Grant shared that OCNMS and partners will submit an application for a federal funding opportunity on Regional Vulnerability Assessments for Ocean Acidification for those interested in working on the outer coast. He shared several short-term projects that were identified as a result of the workshop:

- Incorporating real-time regional data into the classroom in education and outreach school curriculum.
- Including webpages on the OA Sentinel Site in OCNMS's current process of re-designing its website
- Ensuring OA components during E/V *Nautilus* 2017 research cruise in OCNMS
- Collecting full water sampling at OCNMS oceanographic mooring buoys to obtain direct OA parameters to help refine modeling efforts

Carol added that we will also work immediately on completing an inventory of existing efforts of OA in this particular geography and refining what a Sentinel Site will be. Long -term needs and objectives include:

- Discussing specific OA management questions for the geography of the Olympic Coast
- Jointly defining what a larger collaborative OA research and monitoring plan would look like to identify gaps in funding and efforts
- Defining a potential governance structure for the partners of an OA Sentinel Site

Recruitment of Citizen-at-large and Research Seats –Karlyn reminded the council that the term end for primary and alternate members for Citizen-at-large and Research seats is December 31, 2016. All current council members in those positions are eligible to apply for another term, and have been notified. The Federal Register Notice will announce openings on November 1, with an application deadline of November 30.

National Marine Sanctuary Advisory Council Chairs Webinar –Lee mentioned that she will be participating in an upcoming ONMS Advisory Council Chairs webinar. Council Chairs from each of the 14 sites will discuss and provide feedback on the draft ONMS Strategic Plan, currently titled "Our Vision for American's Treasured Ocean Places: A Five-year Strategy for the National Marine Sanctuary System." Lee will report back at the November meeting.

UW School of Marine & Environmental Affairs Capstone Project –On behalf of the sanctuary, George Galasso invited incoming students to the University of Washington's School of Marine and Environment Affairs (SMEA) to today's meeting to discuss a draft proposal for OCNMS and its advisory council to work with students with their Capstone Project. Professor Nives Dolsak, who coordinates SMEA's Capstone Project, described the team nature of the Capstone Project (4-6) students which was designed to better replicate the work environment students will encounter after graduation. Student participation would amount to 9 credits of work spanning 2-3 quarters, providing 270 hours of work per student. George proposed the idea of having a group of students review and complete an evaluation of the implementation of 2011 OCNMS Management Plan, with each student focusing on one of the major topic areas. Students would work alongside the staff lead of that program area, and potentially with advisory council members as well. Council members were receptive to this opportunity.

Information Items:

Oceanographic Forecast Modeling Work – Dr. Parker MacCready, UW School of Oceanography, spoke about a modeling tool he and the UW Coastal Modeling Group (CMG) built for regional productivity. The process of wind-driven coastal upwelling along the Olympic Coast leads to this high primary production. High levels of nitrate are seen in tandem with low dissolved oxygen, high carbon and low pH, which can exacerbate ocean acidification and hypoxia. That was a particular issue for Willapa Bay, which produces 1 out of every 8 oysters consumed in the United States. In recent years, oyster larvae growth has been disrupted and linked to low aragonite saturation, a related indicator of ocean acidification (OA). This was a regional driver for state efforts to address OA. The LiveOcean ocean circulation model was created to predict chemical properties associated with OA (http://faculty.washington.edu/pmacc/LO/LiveOcean.html). It provides 3-7 day forecasts of aragonite saturation state and pH of waters entering shellfish growth areas, built on existing 3-D circulation models incorporating carbon chemistry. The modeling domain includes parts of Oregon, all of Washington's coast, inland waters of the Salish Sea and an extent of British Columbia's coast and accounts for rivers, tides, realistic weather winds and ocean forcing. It is comparable to a weather forecasting prediction in its accuracy and appears on the Northwest Association of Networked Ocean Observing Systems (NANOOS) portal.

Parker stated that more and more of the biogeochemical fields will become available in real time, with potential of bringing together models and observations in the near future. The CMG focuses on validation using as many sources of data as possible to test models. He gave examples of validating sea surface temperature trends over the past few years, indicating a marine heat wave ("the blob"); water column findings from CTD instruments taking along NOAA OA cruises; OCNMS moorings and other moorings; mid-shelf pH. Observations are used to help improve and test the models. There are more limitations for improving the model with carbon variables due to a lack of data.

Other groups around the country are also modeling coastal oceanographic conditions: the Coastal Ocean Model Testbed compare ecosystem models using different approaches. This

group focuses on productivity, hypoxia and ocean acidification. The LiveOcean model was also used for the Cassin's Auklet mortality event of 2014-15 with particle tracking. Another use took place in MERHAB (Monitoring and Event Response for Harmful Algal Blooms), an early warning system for *Pseudo-nitzschia* HABs on the Pacific Northwest outer coast beaches, which can cause paralytic shellfish poisoning.

Parker's presentation can be found online at:
http://olympiccoast.noaa.gov/involved/sac/modelingtools_oa_orhab_maccready.pdf.

Methane Seeps of Cascadia Margin: Results from 2016 Cruise on E/V Nautilus – Dr. Robert Embley, NOAA-PMEL Geophysicist, presented results on seeps and ecosystems along the U.S. Cascadia Margin from the June 2016 E/V *Nautilus* research cruise. The cruise was led by Ocean Exploration Trust and included multiple partners including NOAA-PMEL, OCNMS, NWFSC and SWFSC, ONMS Marine Heritage Program, University of Washington and Oregon State University. One of the main focuses of the cruise was to study the methane seeps, which have been known to be present in this region, and the potential for methane release or hydrate destabilization as ocean warming occurs. Multi-beam bathymetry technology now enables the mapping of methane plumes, and allows scientists to better understand methane seep habitat while establishing a better baseline characterization and distribution of seeps along the Cascadia Margin. Additionally, the project set out to obtain gas samples of bubble plumes, push cores, carbonates and macrobiology, and to determine whether the bubbles had an acoustic signature.

Bob shared videos of the methane plumes from water column surveys. The Juan de Fuca Plate is being subducted beneath North American Plate below the underwater Cascade Volcanoes, creating a new ocean crust a few hundred miles offshore. Methane accumulates in these locations where sediments accrete from ocean plate. As methane is released and migrates up into the water column, it reaches a pressure-temperate condition at ~500 m depth where hydrate transitions to gas. As a result of this cruise, there are now more than 500 known bubble plumes distributed along ~850 nautical miles of the margin.

Bob highlighted research cruise findings from the northern to the south ends of the margin. Microbial communities were formed where there was a presence of high carbonate presence. The Astoria Canyon had some particularly interesting methane seeps and invertebrate organisms along the canyon floor, along with observations of hydrate on the canyon floor at 850 m depth. Overall, the cruise detected hundreds of new bubble plume locations in depths ranging from 125 to 1630 m, with nine sites characterized by ROV *Hercules*. A September *Nautilus* cruise found an additional >50 bubble plumes in South Oregon and Northern California, where less activity had been recorded. The importance of seeps as a deep sea habitat was deduced by the large number of active sites discovered and the large areas of associated carbonate upgrades.

Bob's presentation can be found online at:
http://olympiccoast.noaa.gov/involved/sac/present_cascadia_margin_embley.pdf.

Reports of the cruises can be found at http://www.pmel.noaa.gov/eoi/pdfs/2016-PacificCoast-NA072-CruiseReport-hires.pdf and http://www.pmel.noaa.gov/eoi/pdfs/2016-PacificCoast-NA072-CruiseReport-lores.pdf.

Public Comment– Catherine Gockel of EPA Region 10 is working on a National Pollutant Discharge Elimination System (NPDES) wastewater discharge General Permit for offshore seafood processors off the coast of Washington and Oregon, covering federal waters in the EEZ (between 3 and 200 miles offshore). Some of the comments they received expressed concerns for triggering or exacerbating hypoxic conditions and harmful algal blooms from these discharges. She has been looking more into this, reviewing literature and talking to scientists. They plan to release another public notice period within a few months.

OCNMS Advisory Council Charter Renewal Subcommittee Report and Recommendations – Mike Barton, Subcommittee Chair, presented draft recommendations from the Charter Renewal Subcommittee. Their recommendations on changes include:

- Allow alternate council members to serve as Vice-chair or Secretary on the Executive Committee, but require that the Chair is a primary member. The primary and alternative member of one seat not allowed to serve simultaneously on Executive Committee.
- Change the date of elections for AC Executive Committee from January to March Advisory Council meeting to ensure that any potential candidates reapplying to serve a consecutive term in his/her seat is re-instated before running.
- Incorporate 2015 Charter amendment made to change name of Commercial Fishing Seat to "Fishing" seat.
- Update dates (years) in tables listing seat representation or term ends. Add a quorum chart to depict voting members (non-government and government)
- Remove U.S. Geological Survey seat on AC, based on their inability to dedicate staff to participate. USGS requested we consult with them again in 5 years during next Charter renewal process in the event they are in a better position to rejoin.
- Update 2016 OCNMS AC Charter to reflect changes in National Marine Sanctuaries Advisory Council Handbook

There was concern and discussion about allowing alternate council members to serve as an officer (Vice-chair or Secretary) on the Executive Committee. The National Advisory Council Coordinator also expressed concern about this, but agreed that stipulating the Chair must be a primary seat representative addresses this concern. OCNMS would be the first site to allow alternate members on its advisory council Executive Committee. One of the challenges identified to having alternates serve as an officer is if the council returns to a voting system rather than using consensus, in which case the hierarchical distinction of positions would be stronger for voting seats. Preference was expressed for having a fully populated Executive Committee to help set meeting agendas, develop annual work plans, and fulfill other duties. Three members (Chair, Vice-chair and Secretary) are viewed as the minimum number of officers to help balance the process of the advisory council. Council members felt more comfortable with stating a preference for primary members serving as Vice-chair or Secretary, but that

alternates could be nominated if a primary member was not willing to serve or be nominated. Another potential issue could arise if the Chair (primary) had to step down or could not be present, and by the Charter the Vice-chair, who could be an alternate, would step in for the Chair. In this case, a mid-term election would be held to quickly identify a new Chair. Jennifer Hagen moved to amend the proposed recommendation for having alternate members serve as Vice-chair or Secretary in the case that no primary members are willing or able to serve. The council agreed to vote on this issue again at the November 4 meeting with revised resolution language, as well as a strike-out version of the OCNMS AC. Upon request, Karlyn will send the National Sanctuary Advisory Council Model Charter of 2010 showing the marked-up revisions headquarters made in 2014 to any council members before the November meeting.

Ocean Observation Update: Monitoring Ocean Acidification, Harmful Algal Blooms and More– Dr. Jan Newton, Co-Director of Washington Ocean Acidification Center (WOAC) and Professor of Oceanography at University of Washington (UW), presented on monitoring efforts and findings using regional buoys off La Push in OCNMS. She shared key science issues from 2009 including the complexity of the system and how under sampled the Washington coast is. The WA coast experiences seasonal hypoxia and strong inter-annual variation but differs from neighboring Oregon. A hotspot for HABs is located at the Juan de Fuca eddy. WA coast is already showing OA effects today, and model accuracy is limited by data input. They proposed an ocean observing system for researching ecosystem response to climate change using a multi-platform high-resolution sensor array. The system consists of the Chá bă buoy, a NEMO subsurface profiling buoy, now with an Environmental Sample Processor (ESP) that monitors harmful algal blooms, and a sea-glider to provide improved dimensionality of the waters.

Jan shared real time data for temperature and depth, and highlighted the oscillation of temperature gradient due to internal waves (up to 30 m high). This hadn't been understood until recently but is now published and explains how deep water comes to the surface, bringing nutrients along with low oxygen, high CO2 and low pH waters. Data also showed how the marine heat wave (aka "the blob") remained offshore during upwelling winds, but came into coastal waters during shifts to downwelling winds. The buoys also help scientists better understand the seasonal influence of the Columbia River on salinity and other water properties in OCNMS. Low oxygen events happen in different wind conditions, with possible association with upwelling of the waters in the canyon and advection towards the coast; the other situation could be possible advection from wind events bringing lower oxygen from Cape Elizabeth. There is still so much to learn about the dynamics, and a summary of what they learn each year is published in "Puget Sound Marine Waters Overview" (www.eopugetsound.org/articles/2014-puget-sound-marine-waters-overview). Jan noted that the Puget Sound is fed by waters from the Olympic Coast. The Juan de Fuca Eddy is a known generation site for HABs, and upwelling can bring HABs to the coast during seasons with weak storms. The Environmental Sample Processor (ESP) is a sophisticated real-time detection system for HABs, and has been integrated into the NEMO mooring buoy. It can detect certain species of HABs and associated toxins and has implications for rapid resource management and human health decisions. Colleagues in NOAA-PMEL have been working to establish the Ocean Acidification National System, including adding sensors to the Chá bă buoy, which is part of the national network of OA buoys. They

also now have a pH sensor at 50 m on Chá bă. Jan compared monitoring abilities in 2015 with 2009; we now have an increased capacity, and the WA coast is now sampled in near real-time, with physical dynamics revealed and findings published. Seasonal hypoxia can be observed by tribes and agencies in real-time, and HAB hot-spots are being monitored for toxicity. The Chá bă buoy shows year-round effects of OA and has improved model accuracy.

The Washington Ocean Acidification Center (WOAC) implements key recommendations to assess water conditions and what drives OA; provide forecasts to facilitate adaptation; assess how local species respond; and inform aquaculture practices. They are excited for the release of a Global OA Observing Network (GOA-ON) portal, and regional NANOOS data is included on this international network.

Dr. Simone Alin, Oceanographer at NOAA-PMEL, followed with a presentation of preliminary findings on carbonate chemistry in the waters of OCNMS based primarily on OCNMS mooring data. In surface waters, fluctuations in both oxygen and carbon dioxide are often dominated by biological production, compared to bottom waters where decomposition involves consumption of oxygen and creation of CO2. Simone's work involves developing an algorithm that uses readily available proxy parameters to estimate carbonate chemistry, in particular aragonite saturation state, since direct measurements of ocean acidification are challenging to obtain. Throughout the northern California Current Ecosystem Dr. Alin estimated DIC, total alkalinity, aragonite saturation, pH and pCO2 using existing measurements for temperature, salinity, oxygen, nitrate concentration, and density, but cautioned that water depth may introduce error due to additional mixing of waters involved closer to the surface and other factors. Simone's preliminary results used direct measurements from cruises as calibration data validate algorithm results and help characterize sanctuary-specific relationships for carbonate parameters OCNMS mooring data. The results were applied to the time series data from moorings in two locations in the sanctuary: north (Cape Alava) and south (Cape Elizabeth). Ultimately, they hope to incorporate data from all assets on the outer coast to elucidate offshore-onshore patterns of surface and bottom water dynamics and changes through time. Simone shared some of the plots and profile data from different depths, which revealed spatial differences in the northern and southern parts of the OCNMS. Data plotted from the north time-series (Capa Alava) show the following trends:

- Temperature shows an increase in range and variability, and clearly identifies "the blob" or persistent marine heat wave.
- Salinity captures the freshwater influence at the beginning and end of the season
- Oxygen results show only occasional dips into hypoxic conditions for deeper waters.
- The pH range of 7.4 to 8.25 is within Clean Water Act bounds, but could still potentially stress certain organisms at depth.
- Aragonite saturation results show corrosive summer conditions at all depths, especially given that some local organisms are sensitive to thresholds at or above 1.0.

Data plotted from the south time-series (Cape Elizabeth) show the following trends:

- Temperature also shows an increase in range and variability of values from offshore to onshore.

- Again, there was evidence of freshwater influence for salinity, with a stronger signature at shallower depths.
- Oxygen levels at Cape Elizabeth show increased duration of hypoxic conditions, along with a seasonal progression toward lower oxygen at depth.
- The pH values show a seasonal progression to a lower pH at deeper depths, with less variability overall compared to the northern moorings.
- Aragonite saturation measurements indicate corrosive conditions at bottom habitats for most of the summer, especially at depth but even at 15 m water depth.

Comparing Puget Sound with the Olympic Coast, there is stronger CO2 variability in the Puget Sound surface waters, and overall higher values than off the outer coast. Atmospheric CO2 is also more enriched in the Puget Sound due to all of the human activities and anthropogenic inputs. Based on aragonite saturation results, marine waters at the entrance of Puget Sound are now estimated to be about 25% more corrosive than during pre-industrial times. Overall, proxy estimates of OA-related biogeogchemistry did show strong gradients within OCNMS, with north to south differences in pH and aragonite saturation state, and an increase in hypoxic conditions with respect to frequency, variability and severity. However, results also suggest that benthic habitats spend more time in corrosive conditions than in hypoxic conditions.

Jan's presentation can be found online at:
http://olympiccoast.noaa.gov/involved/sac/update_ocean_observation_newton.pdf.

Guided Presentation of NANOOS Data Portal – Jan Newton provided a primer on the Northwest Association of Networked Ocean Observing Systems (NANOOS) website and portal, since new information and updates have recently been posted www.nanoos.org. She highlighted the "News" tab, which shares the latest announcements and links to their social media platforms. On its home page, she recommended using the real-time HABs page with NEMO buoy data (www.nanoos.org/products/real-time_habs), including updates on toxin presence and abundance. The NANOOS Visualization System (NVS) (http://nvs.nanoos.org) gives access to the Data Explorer, a "kitchen sink" of all their data. On this page, data is also organized for specific users or information, such as Tsunami Evacuation Zones, Boaters, Tuna Fishers, Shellfish Growers, Climatology (where individual sites with buoys can be queried) and more. Jan encouraged everyone to go onto NANOOS's website to explore and get familiar with the information that is available and to take advantage of real-time data. She also suggested we utilize the "Contact" tab to submit any questions or requests for certain data that partners are in need of.

Public Comment– Jeff Hummel shared that he owns an 80 foot vessel and plans to make three documentaries on shipwrecks in OCNMS, with targeted audiences in Japan, United Kingdom and the United States. Each documentary will involve a different shipwreck. He will work with sanctuary staff on obtaining any required permits.

Superintendent's Report – Carol referred council members to the September 2016 Office Report for updates on sanctuary activity in the past two months, which can also be found

online at: http://olympiccoast.noaa.gov/involved/sac/officereport_sept_2016.pdf. She also welcomed council members and public attendees to pick up a copy of the Earth Is Blue magazine produced by the Office of National Marine Sanctuary System.

1. Carol welcomed Jenny Waddell, the new Research Coordinator for OCNMS.
2. Brendan Bray from ONMS's Facilities Program spent several days on a site visit to OCNMS to review infrastructure needs regarding OCNMS vessel replacement and the vision for a long-term visitor center. Currently there is an emergency engine repair on R/V *Tatoosh* in order to complete the 2016 field season.
3. The International Coastal Cleanup took place on September 17, involving many partners. More than 400 volunteers turned out to clean up the beaches. Carol participated on Second Beach and then attended the second annual Salmon Feed, Poetry Read in Forks, to bring together cleanup volunteers in a social and celebratory setting.
4. There were numerous education and outreach activities throughout this period, including annual Junior Oceanography and Marine Technology/ROV camps, a Hoh Watershed rafting and camping trip, teacher trainings, participation in Makah Days, and more.
5. The NOAA education kiosk was just installed at the Forks Visitor Center, and another kiosk will soon go up in Kalaloch Lodge. The Forks community was very enthusiastic about the new kiosk.
6. Significant work has been accomplished on the Habitat Framework, a joint project with Intergovernmental Policy Council (IPC). Nancy Wright completed the first two segments of constructing habitat classification systems for geomorphology and sediments. The product was done with NatureServe and delivered to the IPC. They will present this to the advisory council at some point in the future.
7. Papahānaumokuākea Marine National Monument was recently expanded from ~140,000 to ~583,000 square miles by proclamation of President Obama under the Antiquities Act. It now stands as the largest marine protected area in the world, and will undergo review for management implications.

Member Reports and Future Agenda Topics

- Mike Barton spoke on behalf of Bob Boekelheide, who is participating in Sequim's Dungeness River Fest today and this weekend. He will be conducting a salmon and river walk tomorrow at 11am.
- Mark Ozias reiterated his enthusiasm for the NOAA education kiosk at Forks Visitor Center and thanked the sanctuary on behalf of the town. He also appreciated the science updates at today's meetings and will be sharing this at an upcoming coordinating meeting for Clallam County.
- Casey Dennehy announced the Coastal Marine Resources Committee Summit in Long Beach on October 20-22 with topics covering shoreline master plans, marine spatial planning, and coastal erosion. It will include a section on ocean acidification and panel discussion on shoreline master plans. Surfrider Foundation's Leadership Academy will present the project that they will be working on as well. The Summit is open to the public.
- John Veentjer distributed the 2017 calendars from Marine Exchange of Puget Sound.

- Dan Ayres mentioned a harmful algal bloom coming up from the south. The Long Beach razor clam season is postponed for now, with updates to be released next week.
- Commander Aaron Meadows announced that USCG continues to work on implementing voluntary regulations for fishing vessels, including a framework for voluntary inspections, with a focus on preventing engine problems, drifting, flooding and other issues.
- Jennifer Hagen shared recent overflight photos as part of a derelict fishing gear project that she is working on. Since last year approximately 50 crab pots were removed, so they observed far fewer pots this year and believe about 70 are remaining to be retrieved.
- Jan Newton shared NANOOS business cards with the website its NVS (NANOOS Visualization System. She thanked everyone for coming to UW-Seattle.
- Stephanie Sleeman shared that the US Navy is at the end of their fiscal year, and that by the next meeting they will be in a new spending cycle. Like all agencies, they are expecting reductions in the budget. They are working to analyze their projects with NMFS new noise level thresholds for marine mammals. The tighter noise thresholds had an increase on marine mammal take numbers, particularly for harbor seals and harbor porpoises.
- Jennifer Hennessey shared that they received policy recommendations from the WCMAC at their July meeting on marine spatial planning. WDOE has been working on the spatial side, analyzing the data. Their next meeting will take place on September 28 in Aberdeen at the Port of Grays Harbor, and is open to the public.
- Steve Shively shared that Olympic Peninsula tourism numbers were very good this season, with Jefferson County numbers up 24% (calculations not yet finalized). Record revenue values reflect this trend. In August he was able to host and participate in ONMS national video making to showcase the tourism and recreation values of sanctuaries to coastal communities in Moclips, Lake Quinault and Kalaloch. The annual Dungeness Crab and Seafood Festival in Port Angeles is coming up on October 7-9 and will include art creations from the marine debris collected during the International Coastal Cleanup.
- Katrina Lassiter shared that WDNR designated its first freshwater aquatic reserve at Lake Kapowsin in the east end of Pierce County. It is special for its underwater trees from a mudflow that dammed a creek and drowned the forest 500 years ago.
- Lee Whitford thanked the sanctuary staff for their hard work and efforts putting on an incredible Ocean Acidification Sentinel Site workshop, and to Meg Chadsey for facilitating.
- Dave Hudson concluded with a tradition Hoh prayer song to send everyone off safely on their travels, and thanked everyone for their participation in the meeting.

The next OCNMS Advisory Council meeting will take place on **Friday, November 4th** in Montesano at the Montesano City Hall. The meeting was adjourned.